

OPEN PEER REVIEW REPORT 1

Reviewer: John Mitrofanis, University of Sydney, Australia.

Comments to the authors:

This study explores the impact of lesions to the midbrain dopaminergic cells and/or mediodorsal thalamic nucleus on the firing rates and patterns of cells in the cerebral cortex of rats. The manuscript is well-written and the results presented clearly. The study is rather important, in view of the evidence of cognitive decline in Parkinson's disease patients. Their findings will be of some interest and make a worthwhile contribution to the literature. Some points to consider:

- . the authors should make it clearer as to which dopaminergic pathway is affecting the prefrontal cortex, namely the nigral and/or tegmental one. If the latter, why not inject 6OHDA directly into the VTA?
- . the authors should really present some TH cell counts of each lesioned rat, quantifying the extent of the lesion.
- . figure 2 is rather poor. The MD lesion site is not well-defined (I can barely see a difference between both sides) and the TH-section looks a little out of focus. I would present images of the 6OHDA injection site, together with a better example of a MD lesion.....
- . I understand that the authors have an interest in MD and prefrontal cortex, but my initial feeling when reading this manuscript was "why did they not explore VL and motor cortex?". The motor signs of the disease are clearly the better known and most striking. I think a small section in the Discussion (despite this section being rather long already) addressing this issue is warranted.
- . I feel the authors should have a "Conclusion" section, placing their results in context of the disease in humans and any translational implications. It would really strengthen the appeal of the manuscript.